# Students’ voices on online enrichment in mathematics

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This presentation reports on a study on upper secondary school students’ opinions and views regarding an online enrichment in mathematics. Interviews were conducted with seven participating students and the students express the enrichment deepened their mathematical knowledge, in line with the fact that learning requires challenges. They enjoy to always have a challenge to work on and also freedom to decide when to work on it, which connects to the description of mathematically highly able students as autonomous. Several students explicitly point out that they like that the work was not graded. Students differed in terms of working alone or with peers. The online enrichment offered mathematical challenges for most students, but some would have liked even more difficult tasks. Their involvement differed depending on other school work.

## A change of direction

From an almost absent topic of conversation at schools or in research, highly able students have gained more attention in the Swedish and Scandinavian context. Initiatives have been taken in which highly able students are in focus. For instance, in the mapping materials for preschool class, teachers are given instructions on how to detect and support children who have reached further in their development (Margrain & van Bommel, 2023). Also, Mellroth et al. (2021) studied upper secondary teachers’ professional development on differentiated instruction in mathematics to support learning opportunities that includes highly able students. However, there is still a lack of empirical studies where highly able students can express their opinions themselves (Szabo, 2017). In this paper we try to elicit students’ opinions and views on online enrichment offered in mathematics at upper secondary school.

## Enrichment

Offering support to highly able students can be done in different ways. Acceleration supports social and knowledge development (Colangelo & Assouline, 2009). Enrichment on the other hand, offers an opportunity for differentiated instruction in mixed ability classrooms (Tomlinson, 2016) and might therefore be more suitable within the Swedish school system. Enrichment facilitates learning possibilities for all students and can thus be used to challenge those with high ability while other students have enough challenges with regular tasks.

## The project

During 2021-2023, 17 students took part in online enrichment in mathematics at an upper secondary school in Sweden (van Bommel & Mellroth, 2023). These students either asked themselves to join the project, or were proposed by a teacher. The structure and tasks used in the online enrichment followed the themes defined by Szabo (2017) in which students’ needs in class were elaborated on for example, they want to be expected to work hard, to be encouraged to use their imagination, and to think systematically and critically. Seven students were interviewed in order to capture their motive for participation, their expectations, the experienced level of enrichment and future wishes.

## Preliminary results & points of discussion

Preliminary results show that students wanted to participate because they like mathematics and want to get challenged beyond the regular textbook. They like the connection with the regular content taught in class and express the enrichment offered a deeper understanding of the content. However, some students would have liked even more challenging tasks. The students appreciate to finally have something to think about and always have something to work with. They work in their own speed and their involvement differed depending on other school work. Not getting graded is described as positive. The students differed in the way they liked to work with the tasks, in class or outside class, in pairs or alone. These findings are in line with the fact that learning requires challenges and the description of highly able students as autonomous learners. During Madif the results will be discussed more in depth and related to differentiated instruction in mixed ability classrooms. Moreover, we would like to discuss alternative ways to capture students’ voices given the specificities of this group of students.

## References

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